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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/510,512	10/07/2004	Katsuhiko Takahashi	Q83567	8886

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EXAMINER

VIJAYAKUMAR, KALLAMBELLA M

ART UNIT	PAPER NUMBER
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1751

SHORTENED STATUTORY PERIOD OF RESPONSE	MAIL DATE	DELIVERY MODE
3 MONTHS	04/04/2007	PAPER

Please find below and/or attached an Office communication concerning this application or proceeding.

If NO period for reply is specified above, the maximum statutory period will apply and will expire 6 MONTHS from the mailing date of this communication.

Office Action Summary

Application No.

10/510,512

Applicant(s)

TAKAHASHI ET AL.

Examiner

Kallambella Vijayakumar

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-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 07 October 2004.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-14 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1-14 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on _____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☒ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
 2. ☐ Certified copies of the priority documents have been received in Application No. _____.
 3. ☒ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- | | |
|---|---|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892) | 4) <input type="checkbox"/> Interview Summary (PTO-413)
Paper No(s)/Mail Date. _____ |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948) | 5) <input type="checkbox"/> Notice of Informal Patent Application |
| 3) <input checked="" type="checkbox"/> Information Disclosure Statement(s) (PTO/SB/08)
Paper No(s)/Mail Date _____ | 6) <input type="checkbox"/> Other: _____ |

Detailed Action

- This application is a 371 of PCT/JP03/04514 filed 04/09/2003. Receipt is acknowledged of papers submitted under 35 U.S.C. 119(a)-(d), which papers have been placed of record in the file.
- The preliminary amendment filed 10/7/2004 has been entered.
Claims 3-14 were amended. Claims 1-14 are currently pending with the application.
- The examiner has considered the IDS filed 10/7/2004, 6/13/2005, 1/24/2006 and 12/12/2006.

Claim Rejections - 35 USC § 102

The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(a) the invention was known or used by others in this country, or patented or described in a printed publication in this or a foreign country, before the invention thereof by the applicant for a patent.

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

(e) the invention was described in (1) an application for patent, published under section 122(b), by another filed in the United States before the invention by the applicant for patent or (2) a patent granted on an application for patent by another filed in the United States before the invention by the applicant for patent, except that an international application filed under the treaty defined in section 351(a) shall have the effects for purposes of this subsection of an application filed in the United States only if the international application designated the United States and was published under Article 21(2) of such treaty in the English language.

1. Claims 1-2, 4 and 11 are rejected under 35 U.S.C. 102(b) as anticipated by Bowns et al (US 4,877,512).

The prior art teaches a composition comprising AgCl, Ag-flake, Vinyledene Chloride <binder> and a solvent such as MEK <reducing agent>. AgCl is a solid/powder with a particle size of less than -325 mesh sieve <-50 microns; Claim-4>. With regard to the conductivity in the claims 1 and 2, the prior art teaches a resistivity of 0.1 ohms/sq at a thickness of 1-mil. (Abstract; Cl-3, Example-1). With regard to the

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method claim 11, the prior art teaches coating the composition by screen printing and drying at 150-300F (CI-2, Ln 53-60). All the limitations of the instant claims are met.

The reference is anticipatory.

2. Claims 1-2, 11 and 13-14 are rejected under 35 U.S.C. 102(b) as anticipated by Kydd et al (US 5,882,722).

Kydd teaches an ink composition containing Ag-neodecanoate, Ag-flake, Silver Colloidal suspension <binder> with a particle size of 20 nm in terpeneol <reducing agent>. With regard to the method claims, the prior art teaches screen printing the ink over a Kapton substrate and forming a 10-15 micron thick conductive pattern, with a resistivity of 2.11-2.93 microhm/cm (CI-12, Example-III; Fig-4 and 9) that clearly shows the welding of silver particles by fusion. All the limitations of the instant claims are met.

The reference is anticipatory.

3. Claims 1-2, 4-8 and 11-12 are rejected under 35 U.S.C. 102(b) as being anticipated by Dietz et al.

Dietz et al teaches a polymeric adhesive composition comprising an organic polymer resin, an inorganic filler and a fugitive liquid, wherein resin filler is present as a particulate with a particle size passing through 325 mesh (i.e. less than 50 micron). The polymer resin included epoxy and polyethylene terephthalate. The inorganic filler included silver and silver resinate powders with a particle size passing through 325 mesh (i.e. less than 50 micron). The organic liquid included organic solvents such as aromatic hydrocarbons, aliphatic hydrocarbons and glycol ether acetate <Reducing Agent> (Abstract, CI-2, Ln-16-25; CI-3, Ln 35-37; CI-4, Ln 25-56, CI-5, Ln 15-20; C-8, Table-1).

With regard to the conductivity in the claims 1 and 2, the prior art teaches a resistivity of 57×10^{-6} ohms/cm. With regard to claim-6, the prior art composition and the resins in the composition are either same or substantially same as that claimed by the applicants, the instant claimed reducing action by the binder will be inherent. With regard to the method of forming a conductive coating in claims 11-12, the prior art teaches coating a paste by applying a film over a circuit board and drying at a temperature of 175C for 8 mins (CI-9, Ln 39-65). All the limitations of the instant claims are met.

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The reference is anticipatory.

4. Claims 1-6, 9-10 and 11-14 are rejected under 35 U.S.C. 102(e) as anticipated by Kodas et al (US 2003/0124259).

Kodas et al teach a precursor composition comprising a dispersion of a molecular metal precursor such as Silver oxide, silver acetate, or silver salts in vehicles such as terpeneol, toluene or ethylene glycol. The precursor composition further contained binders such as epoxy, phenolic resin and polyester. The molecular metal precursors were present as a combination of nanoparticles with a particle size not greater than 100 nm and micron particles with a with a particle size not less than 0.3 micron and not greater than 10 microns (Abstract, Para 0024, 0032, 0053, 0081, 0098, Pg-5, Table-1, .Pg-9, Table-4, Para 0102, 0140). With regard to claim-10, the prior art teaches a viscosity of 1000 cps <10.dPa.sec> and at least about about 10,000 cps <100 dPa.sec> (Para 0022).

With regard to the method claims, 11-14, the prior art teaches coating the surface of substrate with the precursor composition, and converting fully in to conductive traces at temperatures not greater than 185C (Para 0179, 0200, 0278, Table-06).

Claim Rejections - 35 USC § 103

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

The factual inquiries set forth in *Graham v. John Deere Co.*, 383 U.S. 1, 148 USPQ 459 (1966), that are applied for establishing a background for determining obviousness under 35 U.S.C. 103(a) are summarized as follows:

1. Determining the scope and contents of the prior art.
2. Ascertaining the differences between the prior art and the claims at issue.
3. Resolving the level of ordinary skill in the pertinent art.

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4. Considering objective evidence present in the application indicating obviousness or nonobviousness.

This application currently names joint inventors. In considering patentability of the claims under 35 U.S.C. 103(a), the examiner presumes that the subject matter of the various claims was commonly owned at the time any inventions covered therein were made absent any evidence to the contrary. Applicant is advised of the obligation under 37 CFR 1.56 to point out the inventor and invention dates of each claim that was not commonly owned at the time a later invention was made in order for the examiner to consider the applicability of 35 U.S.C. 103(c) and potential 35 U.S.C. 102(e), (f) or (g) prior art under 35 U.S.C. 103(a).

1. Claims 7 and 10 are rejected under 35 U.S.C. 103(a) as being unpatentable over Bowns et al (US 4,877,512).

The disclosure by Bowns on the composition and the coating as set forth in rejection-1 under 35 USC 102(b) is herein incorporated. The prior art teaches kinematic viscosity of 0.4-0.7 cSt.

The prior art is silent about the particle size of the thermoplastic powder and fails to teach the viscosity per the claims, however it teaches varying the viscosity of the coating solution.

It would have been obvious to a person of ordinary skilled in the art to optimize the particle size of the thermoplastic and/or the viscosity of the dispersion as a choice of design of the coating conditions with reasonable expectation of success, and Generally, differences in concentration, viscosity, particle size, period or temperature will not support the patentability of subject matter encompassed by the prior art unless there is evidence indicating such concentration, viscosity, particle size, period or temperature is critical. "[W]here the general conditions of a claim are disclosed in the prior art, it is not inventive to discover the optimum or workable ranges by routine experimentation." In re Aller, 220 F.2d 454, 456, 105 USPQ 233, 235 (CCPA 1955), See also *In re Boesch*, 617 F.2d 272, 205 USPQ 215 (CCPA 1980) (prior art suggested proportional balancing to achieve desired results in the formation of an alloy).

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2. Claims 4, 10 and 12 are rejected under 35 U.S.C. 103(a) as obvious over Kydd et al (US 5,882,722).

The disclosure by Kydd on the ink composition and the coating as set forth in rejection-2 under 35 USC 102(b) is herein incorporated.

The prior art is silent about the particle size of the Ag-neodecanoate powder, viscosity of the ink and the temperature of the drying the pattern per the claims. However, the prior art teaches testing the film properties as a function of temperature.

With regard to claim-4, the instant claimed particle size of the Ag-salt will be obvious over the 10-15 micron thick dried film pattern.

With regard to claims 10 and 12, it would have been obvious to a person of ordinary skilled in the art to optimize the viscosity of the ink and drying temperature for the pattern as a choice of design of the coating conditions by routine experimentation with reasonable expectation of success, and Generally, differences in concentration, viscosity, particle size, period or temperature will not support the patentability of subject matter encompassed by the prior art unless there is evidence indicating such concentration, viscosity, particle size, period or temperature is critical. "[W]here the general conditions of a claim are disclosed in the prior art, it is not inventive to discover the optimum or workable ranges by routine experimentation." *In re Aller*, 220 F.2d 454, 456, 105 USPQ 233, 235 (CCPA 1955), See also *In re Boesch*, 617 F.2d 272, 205 USPQ 215 (CCPA 1980) (prior art suggested proportional balancing to achieve desired results in the formation of an alloy).

Double Patenting

The nonstatutory double patenting rejection is based on a judicially created doctrine grounded in public policy (a policy reflected in the statute) so as to prevent the unjustified or improper timewise extension of the "right to exclude" granted by a patent and to prevent possible harassment by multiple assignees. A nonstatutory obviousness-type double patenting rejection is appropriate where the conflicting claims are not identical, but at least one examined application claim is not patentably distinct from the reference claim(s) because the examined application claim is either anticipated by, or would have been obvious over, the reference claim(s). See, e.g., *In re Berg*, 140 F.3d 1428, 46 USPQ2d 1226 (Fed. Cir. 1998); *In re Goodman*, 11 F.3d 1046, 29 USPQ2d 2010 (Fed. Cir. 1993); *In re Longi*, 759 F.2d 887, 225 USPQ 645 (Fed. Cir. 1985); *In re Van Ornum*, 686 F.2d 937, 214 USPQ 761 (CCPA 1982); *In re Vogel*, 422 F.2d 438, 164 USPQ 619 (CCPA 1970); and *In re Thorington*, 418 F.2d 528, 163 USPQ 644 (CCPA 1969).

A timely filed terminal disclaimer in compliance with 37 CFR 1.321(c) or 1.321(d) may be used to overcome an actual or provisional rejection based on a nonstatutory double patenting ground provided

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the conflicting application or patent either is shown to be commonly owned with this application, or claims an invention made as a result of activities undertaken within the scope of a joint research agreement.

Effective January 1, 1994, a registered attorney or agent of record may sign a terminal disclaimer. A terminal disclaimer signed by the assignee must fully comply with 37 CFR 3.73(b).

Claims 2-4, 9, 11 and 13 are provisionally rejected on the ground of nonstatutory obviousness-type double patenting as being unpatentable over claim 1-6 of copending Application No. 10/500,124 in view of Kudas et al (US 2003/0124259).

Both the claims of the instant application and the copending application are drawn to similar conductive compositions with similar utility, wherein the instant claims differ from the copending application in requiring a binder, and adding a binder to a conductive paste composition would have been obvious to a person of ordinary skill in the art for the purposes of adhesion of conductive particles to a substrate that is well known in the art as taught by Kudas et al that clearly teaches the addition of binders to composition containing metal/silver precursor compounds in making conductive traces over a substrate (Para-0140). The limitation of comprising in the copending application does not exclude addition of such binders in the composition.

This is a provisional obviousness-type double patenting rejection.

Conclusion

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Kallambella Vijayakumar whose telephone number is 571-272-1324. The examiner can normally be reached on 8.30-6.00 Mon-Thu, 8.30-5.00 Alt Fri.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Douglas McGinty can be reached on 571-272-1029. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

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Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

KMV
March 22, 2007.

A handwritten signature in black ink, consisting of stylized initials followed by a long horizontal line.

Patent Examiner